Renewable DG Potential on State-Owned Property

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Robert B. Weisenmiller
Anthony Eggert

Commissioners
Rweisenm@energy.state.ca.us / 916-654-4001
Aeggert@energy.state.ca.us / 916-654-4930

Overall Outlook

State opportunity to use state property to further state renewable energy goals through coordination and development of RFP that attracts developers and utilities while utilizing current incentive programs.

Methodology

- Started with DGS GIS data for State-Property
  - Assumed distribution system interconnection
  - Removed areas of environmental concern and facilities with existing renewable projects
  - Removed properties less than 4 acres
  - Removed remote locations and Sierra Nevada
- Potential clusters within load centers became apparent
- Identified potential rights of way (ROW) in each area from Google Earth

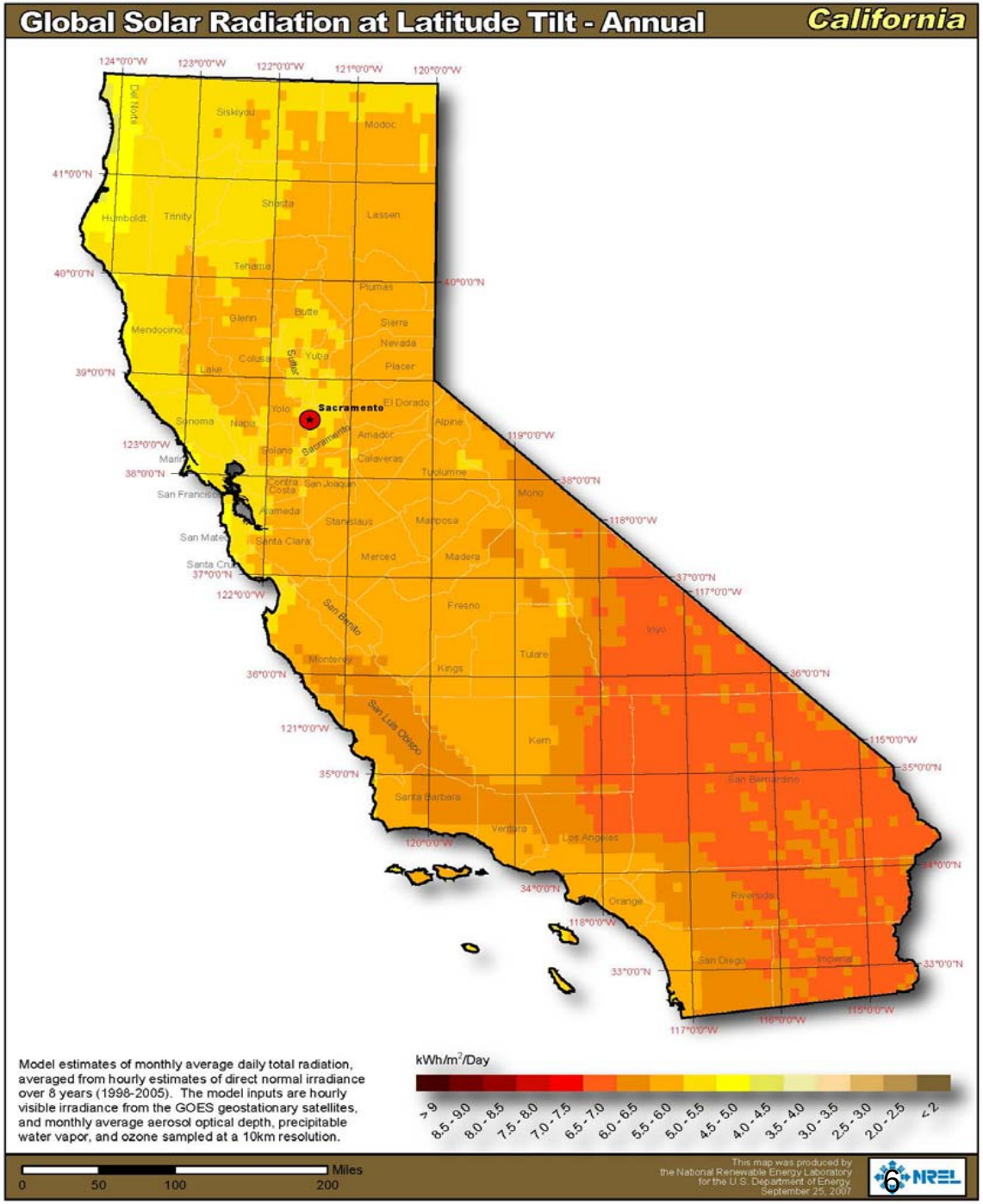
Benefits of Program

- State leadership role
- Support Renewable Portfolio Standard, GHG emission reduction, and Distributed Generation (DG) goals
- Revenue stream and/ or reduce energy costs for State
- Green Jobs
- Partnership with utilities/ existing PV lease programs in place to facilitate project roll out

Rationale of Program

- Less environmental impact
- Lower mitigation costs
- Less environmental review required
- Distribution upgrades less costly
- Agency staffs facilitate building and plan review processes
- Partnership with PV industry

California Solar Resource



Source: NREL see http://nreldev.nrel.gov/gis/pdfs/eere_pv/eere_pv_h_california.pdf

State-Owned Property

- Total state-owned building land/ roof space is 530 properties for approximately 300,000 acres
- Total aqueduct land is 375 miles for approximately 60,000 acres
- Total Caltrans potential ROW availability remains unknown
  - 15,270 miles of state highway
  - 155,884 miles of other public roads

State-buildings Area

- Focus on five load center areas:
  - Greater Sacramento Area
  - Turlock/ Modesto/ Merced Area
  - Fresno Area
  - LA Basin/Inland Empire
  - Greater San Diego Area

Regional Potential

- Sacramento (SMUD) area: 47 – 86 MW
  - 18 locations with 33 structures for 215 acres => 23 – 43 MW
  - 19 ROWs for 216 acres => 24 – 43 MW
- Modesto/Turlock/Merced area: 36 – 65 MW
  - 12 locations with 103 structures 187 acres => 21 – 38 MW
  - 16 ROWs for 137 acres => 15 – 27 MW
- Fresno area: 174 – 313 MW
  - 3 locations with 125 structures for 1,408 acres => 156 – 280 MW
  - 20 ROWs for 164 acres => 18 – 33 MW

Regional Potential

- LA Basin
  - 14 locations with 646 structures for 2,241 acres => 250 – 450 MW
- Inland Empire: 600 – 1,080 MW
  - 11 locations with 899 structures for 4,521 acres => 500 – 900 MW
  - 81 ROWs for 900 acres => 100 – 180 MW
- San Diego area: 386 – 696 MW
  - 8 locations with 689 structures for 3,471 acres => 385 – 695 MW
  - 2 ROWs for 9 acres => ½ to 1 MW

Utility Photovoltaic DG Program

- Southern California Edison
  - 250 MW utility-owned 0.5 MW to 5.0 MW could be on state property
  - 250 MW third-party owned 0.5 MW to 5.0 MW could be on state property (Max. $0.26 per kWh)
- Pacific Gas and Electric ($1.45 billion approved)
  - 250 MW utility-owned on PG&E property
  - 250 MW third-party owned 1.0 MW to 20.0 MW could be on state property (Max. $0.285 per kWh)
- San Diego Gas and Electric
  - 26 MW utility-owned 1.0 MW to 5.0 MW ground mount single axis could be on state property
  - 26 MW third-party owned 1.0 MW to 5.0 MW could be on state property (Max. $0.235 per kWh)

Lessons Learned: SMUD Project

- Benefit from slope of freeway ROW
  - Reduce destruction from vehicle collisions
  - Reduce structure cost to slope panels
- Construction access from rear of ROW
- SMUD assumes maintenance of panels
  - Reduces maintenance cost of ROW
- SMUD has showed great interest in working with State on this project

Developer Input

- Buildings
  - Match system size to energy load of building when possible
  - Cluster smaller buildings into groups
  - Do not remove any buildings from potential consideration
  - Increase or keep rebates in the current tier for state projects

Developer Input

- ROWs
  - Determine projects near interconnection to limit necessary upgrades
  - Prefer larger brown fields to smaller highway ROWs, which are less electrically efficient due to property shape.
  - Facilitate easements across CalTrans properties.
  - Only include state-owned properties to increase long-term project viability

Developer Input

- Process Comments:
  - Reduce transaction number/ costs/ times by pre-approving process/ lease/ PPA and signatories. Use legal resources firm that has experience to help with these agreements.
  - Coordinate RFP/RFI process and agency responsibilities.
  - Limit properties that are fully in use, because it increases construction duration (ie high traffic parking lots).

Next Steps

- Coordinate Multi-Agency Team similar to Renewable Energy Action Team
  - Develop State Program
  - Identify Fatal Flaws
  - Data Needs for Next Steps
- Draft Request for Proposal and Request for Interest
- Coordinate with utilities, industry, and local governments

Next Step Data Needs: State Buildings

- Building plans to determine if roofs can structurally support PV assemblies
- Square footage of each rooftop, subtracting out equipment footprints and protrusions.
- Type and age of roof (is a new roof needed? DGS interested in having PV installer replace the roof if needed?)
- Energy use/ load of each building.
- Contracted full burden energy price (demand charges, taxes, etc.).
- Buildings where additional shade structures could be used.
- Buildings identified for ARRA efficiency upgrades first.

Next Step Data Needs: ROWs

- GIS data for ROWs to determine potential
- Identify electrical interconnections of potential sites
- Re- evaluate all site access restrictions and conditions
- Coordinate with federal highway officials to determine whether interstates are suitable

Next Step Data Needs: DWR

- Review PV/ wind potential at existing facilities and along aqueduct rights of way; locate key rights of way near pumping stations.
- Provide study of constraints for PV installations over aqueduct.